Factors associated with Insomnia Severity Index among elderly participants

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Abstract

Background: Amongst various psychiatric disorders in the elderly, insomnia is one of the major challenges. Aims & Objectives: To assess the prevalence of insomnia and the factors associated with it among the elderly. Material & Methods: This cross-sectional study was conducted in a rural and an urban area of Delhi taking 115 participants from each area using systematic random sampling. A semi-structured questionnaire was to collect the data. Results: Out of 230 participants, 121 (52.6%) were females and 109 (47.4 %) were males. Insomnia was more prevalent in the elderly participants of rural area (95%) while just 5% were in the urban population. Out of the 230 participants, 113 (49.1%) had scores of 0-7 whereas 117 (50.9%) had scores between 8-28 which meant they had some degree of insomnia. Insomnia was significantly associated with the locality of the participants (p-value <0.05). Conclusion: In the present study, around half of the elderly persons were suffering from Insomnia. As the cause of insomnia is multi-factorial, it needs a multi-pronged approach to prevention which can be achieved by creating awareness, management, and prevention. Further, screening elderly persons for insomnia and health education regarding the importance of sleep hygiene practices should be started.

Keywords

Insomnia; Depression; Elderly'; Community

Introduction

The elderly or geriatric population is characterized by people aged sixty years and older.(1) Over the last century, there is a major shift in population dynamics and epidemiological transition over time in countries like India. Elderly people suffer from multiple medical problems due to an overall decline in immunity and agerelated physiological changes.(2) The burden of mental health disorders is also increasing among the Indian elderly and Insomnia, is one of the major challenges is usually multifactorial but has been mistakenly considered a normal part of aging.(3,4) The International Classification of Sleep Disorders, Second Edition (ICSD-3 2014) defines insomnia as a complaint of difficulty initiating sleep, difficulty maintaining sleep, or waking up too early, or sleep that is chronically non restorative or poor in quality. Primary insomnia is defined as patients with chronic insomnia having no clear or single identifiable underlying cause.(5)

Globally the prevalence of insomnia in the elderly has been reported to be in the range of 12-40%.(6) In India, the data on the prevalence of insomnia in the elderly population has not been reported widely. Therefore, the present study was envisaged to assess the prevalence of insomnia and the factors associated with it among the elderly.

Aims & Objectives

- To assess the prevalence of insomnia among the elderly
- To study the factors associated insomnia among the elderly

Material & Methods

Study Type: The study was a community-based cross-sectional comparative study conducted in selected areas of Delhi. **Study Area**: The villages under Urban Primary Health Centre (UPHC), Fatehpur Beri, and the community UHTC Aliganj were included. Both areas are covered under

the field practice area of the Department of Community Medicine of VMMC and Safdarjung Hospital, New Delhi. **Study Duration**: The duration of the study was for 18 months.

Study Population: The participants for this study were the elderly (above 60 years) residing in selected areas were included in the study. All those who fulfilled the inclusion criteria and gave consent for the study were included as participants till the sample size was achieved. Inclusion Criteria: The inclusion criteria were all elderly above 60 years of age, residing in the study area for at least 6 months. Exclusion Criteria: The persons of >60 years who could not be contacted even after 3 attempts, till the time of completion of data collection, and persons with severe physical/mental illness and/ or are admitted were excluded from the study.

Sample Size calculation: Taking the prevalence of insomnia in north India (urban & rural) was 32% as per the study conducted at Sir Sunderlal Hospital of the Institute of Medical Sciences, Banaras Hindu University (7) with 95% CI, 20% relative error & non-response rate of 10% the sample size was calculated using the formula: $(Z_{1-\alpha/2})^2$ PQ / L^2 , where N = sample size, $Z_{1-\alpha/2}$ is the constant 1.96 for 95% confidence limits, p=anticipated population proportion, Q = (1-p), L= relative error = 20%. After adding 10% as a non-response rate, the sample size comes out to be 224. However, a total of 230 study subjects were selected for the study (115 in Aliganj and 115 in the Fatehpur Beri area). Strategy for collection: A complete list of households with the elderly population was selected and data was obtained. Systematic random sampling was done of houses where at least one elder person resided and was selected for the study. The first house to be included in the study was determined by simple random sampling and then every Nth house was included. 115 elderly people were selected from each area to make it a total of 230 participants.

Consent: Written and informed consent was obtained from all participants.

Data regarding socio-demography and insomnia among the elderly were collected by tools consisting of a predesigned, pre-tested, semi-structured, intervieweradministered questionnaire to collect information about the various socio-demographic profile including age, sex, marital status, socio-economic status, education, and occupation of the study participants. Insomnia is defined as "persistent difficulty with sleep initiation, duration, consolidation or quality." The information about the status of insomnia was collected using Insomnia Severity Index. This questionnaire provides the scoring for the measurement of the quantity of sleep in the elderly. Scores from 0-7 denote the normal quantity of sleep or absence of insomnia, sub-threshold insomnia (8-14); moderate insomnia (15–21); while those scores between (22-28) denote severe insomnia.

Further, the knowledge and associated factors such as

overcrowding, economic condition, comorbid condition, stress, and tobacco of the patient on insomnia were assessed. For screening of depression, a validated Patient Health Questionnaire was used and for assessing alcohol dependence in participants, the CAGE questionnaire was used.

Ethical Approval: Ethical clearance was obtained from the Institute Ethics Committee of Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi. At the end of the study, findings have been used to suggest measures to control insomnia in the community. IEC activities were conducted among study participants for the same.

Data Analysis: The data collected was both qualitative and quantitative in nature. Qualitative data included comorbid illness, risk factor history, other risk factor history, housing conditions, etc. Quantitative data included sociodemographic profile, and insomnia severity index. All the data were coded and entered into a master spreadsheet on MS Office Excel and later transferred to SPSS (IBM SPSS Statistics 21.0) for analysis. Appropriate tests of significance between proportions (i.e., Chi-square and Fisher's exact test as applicable) at p-values of less than 0.05 were taken.

Results

The locality of the house participants was categorized into urban and rural (<u>Table 1</u>). The participants at Aliganj center were identified as Urban (n=115;100%) whereas all the participants from Fatehpur Beri center belonged to the rural category (n=115; 100%).

Most of the elderly participants 179 (77.8%) were in the age group of 60-70 years, 44(19.1%) participants were in the age group of 71-80 years while only 7(3.1%) belonged to the age group of more than 80 years. The majority of the study participants 121 (52.6%) were females and 109 (47.4%) were males. Almost half of the study participants, 135 (58.7%) were married, and their partners were alive whereas 95 (41.3%) participants were either widowed or unmarried or were divorced. As far as religion was concerned, most of the study participants, 196 (85.2%) were Hindus. It was observed that the majority of the elderly 137 (59.6%) were literate. 107 (46.6%) were homemakers and the rest were engaged in skilled/semiskilled jobs or working in shops /doing clerical jobs or were professionals.

The majority of the elderly 168 (73%) were in nuclear families and others were in joint or extended families and very few 16 (7.0%) were staying single. About 82 (35.7%) of the elderly belonged to the upper middle class and 63 (27.4%) belonged to the upper class as per the BG Prasad classification of socio-economic status.

Only 39 (17%) of the elderly had some type of health insurance whereas the majority 191 (83%) had no such insurance.

Elderly participants were categorized into four categories on the basis of the Insomnia Severity Index. Out of the 230

elderly, 113 (49.1%) were having a score of 0-7 which was not clinically significant insomnia whereas 117 (50.9%) were having a score between 8-28 which meant they had some degree of insomnia. This was further classified into sub-threshold insomnia (scores of 8-14), clinical insomnia of moderate severity (scores 15-21), and severe clinical insomnia (scores of 22-28). It was observed that the difference in the proportion of elderly participants living in urban and rural areas on the basis of the Insomnia Severity Index was not statistically significant (p=0.81).(Table 2)

Factors associated with insomnia severity have been given in (Table 3). Insomnia was significantly associated with age, sex and type of family. Insomnia was not found to be significantly associated with socio-economic status (p-value 0.19), environment in bed room of sleep (p-value 0.75), condition in bedroom of sleep (p-value 0.54) and financial dependency (p-value 0.35). Moreover, insomnia was significantly associated with the locality of the participants (p-value <0.05). Insomnia was more prevalent in the elderly of rural area (95 %) while just 5% in the urban population.

Insomnia was significantly associated with smoking (p-value <0.05). However, the association of insomnia with the consumption of alcohol was not statistically significant.

Data from the present study also suggests that insomnia was significantly associated with depression (p-value <0.05) and with the presence of comorbidities like diabetes mellitus and hypertension (p-values <0.05) but the presence of cardiovascular diseases was not significantly associated with insomnia.

Discussion

In the present study, the prevalence of insomnia among the elderly was found to be 50.9% according to the Insomnia Severity Index. In a rural area, insomnia was present in 52.2%, and in an urban area, it was prevalent in 47.8% of participants. The National Sleep Foundation's 2003, Sleep in America Poll stated that 46% of community-dwelling adults aged 65 to 74 reported insomnia which is comparable to the findings of the present study.(7)

Similar findings were reported in a cross-sectional study conducted by Sanjay TV et al(8) in the urban poor locality of Bengaluru revealed that the prevalence of insomnia was 49%, and Dahale et al(9) in Kerala reported a prevalence of insomnia of 42.2% and Bhat et al(10) reported the prevalence of insomnia to be 53.33% amongst their study participants.

lyer et al(11) in their study reported a higher prevalence of insomnia i.e. 67.4% among the elderly in Karnataka whereas Jaussent et al observed that the prevalence of insomnia was found to be 70% and Ahmad et al(12) in their study conducted in Bangalore, found the prevalence of insomnia to be 82.17% in their study. All of these studies reported findings that were quite high compared

to the present study which could be due to the study setting or methods and tools used.

On contrary to the above findings, a hospital-based cross-sectional study amongst 504 elderly (>60yrears of age) population attending an outpatient clinic in Varanasi by Gambhir et al reported the prevalence of insomnia to be 32% which was lower as compared to the present study.(13) Sakamoto et al (14) found the prevalence of insomnia as 15.2% amongst elderly (>60 years) participants residing in Ladakh (India) using the Insomnia Severity Index and a study conducted by Rani et al(15) at old age homes in Chennai reported the prevalence of insomnia to be 19.3% which was quite low as compared to the present study.

This variation in prevalence rates could be due to methodological differences, demographic background, and geographical location.

It was observed in the present study that the prevalence of insomnia was high among the age group of 60-70 years (65.8%) compared to the age group of ≥70 years (24.2%). There was a statistically significant association between age and insomnia. A cross-sectional study by Ahmad E et al(12) among 600 elderly patients attending NIUM hospital Bangalore observed that the prevalence of insomnia increased from 72.4% to 84.8% as the age increased above 60 years.

In the present study, a higher proportion of 56.64% of females was found to have insomnia as compared to 43.36% of the male subjects. The association between the female gender and Insomnia was found to be statistically significant. A study by Suri et al(16), Dangol et al(17) and Rani et al(15) found that the prevalence of insomnia was significantly higher among females 63.4%.

Insomnia was significantly higher among the elderly who were suffering from or had more co-morbidities. Similarly in a study by Ayoub et al(18) and Foley D et al(19) insomnia was significantly associated with a number of chronic diseases. Insomnia was prevalent in study participants with depression or other comorbidities according to a study conducted by Yang et al.(20)

There was statistically significant association between hypertension and Insomnia in the present study. Similar finding was observed in a study by Newman et al.(21) and Rao et al. who also found that a greater proportion of hypertensives were suffering from insomnia.(22)

Insomnia was higher among the subjects with diabetes and there was statistically significant association between Diabetes and Insomnia. Similar finding was observed in a study by Budhiraja R et al who reported 79% of the subjects having insomnia who were having diabetes.(23) Another study by Newman et al (21) reported that a history of diabetes is significantly associated with a higher prevalence of insomnia. Rao et al revealed that 66.66% of the diabetics were suffering from insomnia.(22)

Conclusion

The present study was a cross-sectional study conducted among adults aged > 60 years in the villages under UPHC, Fatehpur Beri and Aliganj, a locality covered under Urban Health Center of field practice area of Department of Community Medicine of VMMC and Safdarjung Hospital which aimed to estimate the prevalence of insomnia and its associated factors in elderly population of Delhi. In the present study, prevalence of insomnia among elderly was found to be 50.9% overall. Prevalence of insomnia among urban elderly was 47.8% and rural elderly was 53.2%. Insomnia was significantly associated with the locality of the participants. Insomnia was more prevalent in the rural population of Delhi (95%) while just 5% in the urban population. age, gender, nuclear family, taking sleep pills, locality, smoking, depression and comorbidities were significantly associated with insomnia.

Recommendation

Since the cause of insomnia is multi-factorial, it needs a multi-pronged approach to prevention which can be achieved by creating awareness regarding its occurrence, management, and prevention. Further, screening elderly persons for insomnia and prompt management can reduce the burden in the community. Health education regarding the importance of sleep hygiene practices and the adverse effects of insomnia should be provided to overcome this issue.

Limitation of the study

The major limitation of the present study may be attributed to recall bias. Moreover, the cross-sectional nature of the study does not allow to make any conclusion regarding the causal nature of any of the determinants that have been found to be significantly associated with insomnia.

Relevance of the study

There is paucity of literature about the prevalence of insomnia in north India. This study is one of the few community-based studies that was conducted in north India which gives an overview of the burden of the problem of insomnia among the elderly. This study also helped us to understand the various socio-economic determinants which contribute to this problem.

Authors Contribution

All the authors were involved in planning, literature search for the review, preparation of manuscripts and it's proof-reading.

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Tables

TABLE 1: DISTRIBUTION OF STUDY PARTICIPANTS ACCORDING TO SOCIO-DEMOGRAPHIC PARAMETERS

| Parameters | | Urban area | Rural area | Total | | |
|-----------------------|----------------------------|------------|------------|-------|------|--|
| | | No. | No. | No. | % | |
| Age (in years) | 60-70 | 91 | 88 | 179 | 77.8 | |
| | 71-80 | 20 | 24 | 44 | 19.1 | |
| | >81 | 04 | 03 | 7 | 3.0 | |
| Sex | Male | 47 | 62 | 109 | 47.4 | |
| | Female | 68 | 53 | 121 | 52.6 | |
| Marital Status | Married | 67 | 68 | 135 | 58.7 | |
| | Unmarried/Divorced/widowed | 48 | 47 | 95 | 41.3 | |
| Religion | Hindu | 107 | 89 | 196 | 85.2 | |
| | Muslim | 04 | 05 | 9 | 3.9 | |
| | Others | 04 | 21 | 25 | 10.9 | |
| Education | Illiterate | 51 | 42 | 93 | 40.4 | |
| | Literate | 64 | 73 | 137 | 59.6 | |
| Occupation | Homemaker | 57 | 50 | 107 | 46.6 | |
| | Skilled/ Semi-skilled | 16 | 12 | 28 | 12.2 | |
| | Clerical/farm/shop | 18 | 30 | 48 | 20.9 | |
| | Professional | 15 | 15 | 30 | 13.0 | |
| | Retired | 09 | 08 | 17 | 7.3 | |
| Type of Family | Nuclear | 85 | 83 | 168 | 73.0 | |
| Type or railing | Joint | 21 | 18 | 39 | 17.0 | |
| | Extended | 04 | 03 | 7 | 3.0 | |
| | Single | 05 | 11 | 16 | 7.0 | |
| Socio-economic status | Upper | 35 | 28 | 63 | 27.4 | |
| (B.G. Prasad scale) | Upper Middle | 40 | 42 | 82 | 35.7 | |
| | Lower Middle | 22 | 23 | 45 | 19.6 | |
| | Upper Lower | 17 | 19 | 36 | 15.7 | |
| | Lower | 01 | 03 | 4 | 1.7 | |
| Health Insurance | Yes | 21 | 18 | 39 | 17.0 | |
| | No | 94 | 97 | 191 | 83.0 | |

TABLE 2. DISTRIBUTION OF STUDY PARTICIPANTS ACCORDING TO THE INSOMNIA SEVERITY INDEX

| SI. | Parameter (Insomnia) | | Number | | Number (%) | |
|-----|--|------------------------------|-----------------|------|------------------|------|
| No. | | | Urban (Aliganj) | | Rural (Fatehpur) | |
| 1 | 0-7 (Normal) (n=113) | | 52 | 46.1 | 61 | 53.9 |
| 2 | Some degree of insomnia (8-28) (n=117) | | 56 | 47.8 | 61 | 52.2 |
| | Some degree of insomnia | 8-14 (subthreshold insomnia) | 24 | 20.5 | 24 | 20.9 |
| | (8-28) | 15-21(moderate severity) | 17 | 14.7 | 21 | 18.3 |
| | (n=117) | 22-28 (moderate severity) | 15 | 12.9 | 16 | 13.9 |

TABLE 3: FACTORS ASSOCIATED WITH INSOMNIA AMONG THE FIDERLY PARTICIPANTS

| Parameters | Insomnia severity index Scores | | | | | | |
|--------------------------------|--------------------------------|-----|-------|-----|-------|------------|---------|
| | | 0-7 | | | 8-28 | | |
| | | No. | % | No. | % | Chi square | P value |
| Age | 60-70 | 102 | 87.18 | 77 | 65.81 | 12.815 | 0.001 |
| | 71-80 | 14 | 11.97 | 30 | 25.34 | | |
| | >81 | 1 | 0.85 | 6 | 5.13 | | |
| Sex | Male | 66 | 56.41 | 49 | 43.36 | 3.91 | 0.047 |
| | Female | 51 | 43.59 | 64 | 56.64 | | |
| Type of Family | Nuclear | 96 | 82.05 | 82 | 72.56 | 7.41 | 0.006 |
| | Joint | 19 | 16.24 | 10 | 8.85 | 3.712 | 0.054 |
| | Extended | 0 | 0 | 7 | 6.194 | | |
| | Single | 2 | 1.7 | 14 | 12.39 | 10.13 | 0.001 |
| Socio-economic status | Upper | 33 | 28.21 | 30 | 26.55 | 6.019 | 0.197 |
| | Upper Middle | 46 | 39.32 | 36 | 31.86 | | |
| | Lower Middle | 22 | 18.80 | 23 | 20.35 | | |
| | Upper Lower | 12 | 10.26 | 24 | 21.24 | | |
| | Lower | 4 | 3.41 | 0 | 0 | | |
| Environment in bed room of | Hot | 9 | 7.69 | 10 | 8.84 | 0.102 | 0.75 |
| sleep | Cold | 19 | 16.24 | 24 | 21.24 | 0.945 | 0.331 |
| | Optimal | 59 | 50.43 | 32 | 28.32 | 11.75 | 0.001 |
| | As per weather | 30 | 25.64 | 47 | 41.59 | 6.57 | 0.01 |
| Condition in bed room of sleep | Low light, Noisy | 32 | 27.35 | 35 | 30.97 | 0.365 | 0.545 |
| | High light, Noisy | 23 | 19.66 | 26 | 23.0 | 0.385 | 0.535 |
| | High light, No noise | 47 | 40.17 | 43 | 38.05 | 0.108 | 0.742 |
| | Low light, No noise | 15 | 12.82 | 9 | 7.96 | 1.45 | 0.228 |
| Taking sleeping pills | Yes | 15 | 12.82 | 29 | 25.66 | 6.13 | 0.013 |
| Tuking Siceping pins | No | 102 | 87.18 | 84 | 74.34 | 0.13 | 0.013 |
| Locality | Urban | 51 | 43.59 | 5 | 4.92 | 47.87 | 0.0000 |
| 20cuncy | Rural | 66 | 56.41 | 108 | 95.58 | 47.07 | 0.0000 |
| Associated risk factor | Smoker | 23 | 19.66 | 76 | 76.25 | 5.104 | 0.024 |
| Associated fish factor | Non Smoker | 94 | 80.34 | 37 | 32.75 | 3.104 | 0.024 |
| | Alcoholic | 12 | 10.26 | 5 | 4.42 | 2.856 | 0.091 |
| | NON Alcoholic | 105 | 89.74 | 108 | 95.57 | 2.030 | 0.031 |
| Depression | No Depression | 90 | 80.48 | 42 | 52.38 | 42.735 | 0.0000 |
| Depression | Mild Depression | 25 | 19.51 | 47 | 28.57 | 42.733 | 0.0000 |
| | Severe Depression | 2 | 0 | 24 | 13.75 | | |
| Comorbid Disease | DM Yes | 10 | 14.63 | 49 | 28.04 | 36.534 | 0.0000 |
| Comorbia Disease | No No | 107 | 85.36 | 64 | 71.96 | 30.334 | 0.0000 |
| | HTN Yes | 15 | 19.51 | 52 | 31.21 | 30.685 | 0.0000 |
| | NO NO | 102 | 80.48 | 61 | 68.78 | 30.003 | 0.0000 |
| | CVD Yes | 102 | 19.51 | 14 | 9.52 | 0.261 | 0.609 |
| | No Yes | 105 | 80.48 | 99 | 9.52 | 0.201 | 0.009 |
| Financial damanda: | | | | | | 0.05 | 0.35 |
| Financial dependency | Financially independent | 55 | 47.0 | 60 | 53.1 | 0.85 | 0.35 |
| | Financially dependent | 62 | 53.0 | 53 | 46.9 | | |